From: Glinda Cooper
To: Greta Smedje
Subject: Re: SV: Follow-up on formaldehyde - allergy - asthma study
Date: 03/22/2012 12:59 PM

It just occurred to me that "Md" means "median", so that answers the question I sent an hour ago. Thank you again.

Glinda Cooper

▼ "Greta Smedje" ---03/22/2012 07:45:36 AM---Dear dr Cooper,

From: "Greta Smedje" <greta.smedje@medsci.uu.se>
To: Glinda Cooper/DC/USEPA/US@EPA
Date: 03/22/2012 07:45 AM
Subject: SV: Follow-up on formaldehyde - allergy - asthma study

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Dear dr Cooper,

Thank you for your interest in my old studies. Hope you will find my answers useful.

Kind regards,
Greta Smedje
Ass professor
Occupational & Environmental Medicine
Uppsala University Hospital

First a few words on the Swedish school system: In Sweden, mandatory school comprises 9 grades, divided into three 'levels'; grades 1-3, 4-6 and 7-9. (Virtually all adolescents also attend another three years at school, however not compulsory.) Grades 1-3 and 4-6 may be called 'primary school', and grades 7-9 (and the voluntary school) may be called 'secondary school' or 'high school'.

The design of our studies was that we in 1993 randomly chose 39 schools comprising mandatory education. In these we chose the pupils of grades 1, 4 and 7. At follow-up of in 1995 the pupils thus attended grades 3, 6 and 9. Thus the surveys, including data on exposure and health, were performed during the pupils' first and last year of the respective 'level'. After that we gathered health data, but not exposure data, also in 1997.

The 1997 paper presents a cross-sectional analysis of the pupils attending grade 7 in 1993. The 2001 paper includes all the pupils, thus the 1997 paper is not the relevant baseline. We did not publish results from the cross-sectional analysis for the pupils in the lower grades 1993 (however, the results as regards relationships between environment and health were similar as for the pupils in grade 7).

In table 2 in the 2001 paper we have pooled all the measurements of pollutants in the classrooms performed in 1993 and 1995, and report the means and the lowest and highest levels ever measured. The purpose of the table was to give information on the order of magnitude of pollutant levels in the classrooms.

In 1993, 54% of the 98 classrooms had levels below LOD. Among classrooms with detectable levels, md was 10 µg/m3. The distribution was skewed to the right with the highest level at 24 µg/m3 + three 'outliers' at 42, 44 and 72 µg/m3, respectively. In 1995, 24% of the 101 classrooms had levels below LOD. Md for all classrooms was 8 µg/m3 and for those with detectable levels Md was 10 µg/m3. Again, the distribution was skewed to the right, the highest level was 34 µg/m3 and there were no outliers.

(Generally, the levels were higher in the 'primary schools' compared to the 'secondary schools'. This is because the secondary schools tended to be larger, constructed more recently and more often were equipped with an effective ventilation system. This explains the lower levels accounted for in the 1997 paper.)

For the analyses of relationships between pollutant and health parameters we followed the pupils (some of the classes changed classrooms between the surveys) and for each class we calculated the mean levels in the classroom they had attended 1993 and 1995, respectively. For levels below the level of detection we used 2/3 of the LOD, that is 3 µg/m3. (Choosing instead half the LOD would, of course, have given the same level.) The range of levels thus ascribed to each pupil was 3 - 42 µg/m3. 66% were ascribed levels of at least the LOD. The AM was 8 and Md was 7 µg/m3. Again the distribution was skewed to the right with no apparent outliers.

Från: Glinda Cooper [mailto:Cooper.Glinda@epamail.epa.gov]
Skickat: den 15 mars 2012 19:31
Till: greta.smedje@medsci.uu.se
Ämne: Follow-up on formaldehyde - allergy - asthma study

Dear Dr. Smedje:

I am an epidemiologist with the U.S. Environmental Protection Agency, and I am preparing a summary of the relevant studies pertaining to formaldehyde exposure and allergic response/asthma as part of a health assessment we are conducting for this chemical.

I have reviewed your 1997 and 2001 papers on the asthma/allergy incidence study you conducted using measurements taken in schools (see attached pdfs), and had some questions I was hoping you could help me with.

The baseline study (1997 paper) used the 1993 formaldehyde measurements, and the incidence study used the 1993 and 1995 measurement. In the 1993 data, about 2/3 of the measures were less than the detection limit, and the total range was relatively small (< 5 to 10 g/m^3). In the 2001 paper, it also looks like a large proportion of the combined formaldehyde measures were less than the detection limit (geometric mean = 4 g/m^3), but there is a wider range of exposures (up to 72 g/m^3).

1) Can you tell me what proportion in the 2001 paper was less than the detection limit, and how these were treated in the analysis (i.e., were they dropped as "missing" values, or were they set as a value of ½ the detection limit, or some other value)? Can you tell me anything more about the distribution of values that were above the detection limit (i.e., what is the mean and median among those that were greater than the LOD)?
2) I am trying to get a better sense of how the distribution of exposure could be affecting the linear regression analysis you conducted. Is it possible to look at a 3-level variable (e.g., < detection limit, 5 – 35 (or whatever the median is among those that are above the LOD, and 35 – 72) to get a sense of risk at the lower levels of exposure?

I appreciate any assistance you can provide about these questions (but I certainly understand the difficulties in going back to data sets completed so many years ago).

(See attached file: Smedje_IntJTubercLungDis_2001.pdf)(See attached file: Smedje_ClinExperAllergy_1997.pdf)

Sincerely,

Glinda Cooper

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Senior Epidemiologist

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